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using a pH meter that was previously calibrated with pH 7.0 and pH 4.0 buffer solutions. To this is slowly added the oil phase, prepared as described above in Ex. 1, and agitation is increased to 450 rpm to reduce the average particle size to less than 200 μm . 12.5 g of a 37 wt % aqueous formaldehyde solution is then added and the temperature raised to 55° C. The solution is heated at 55° C. for two hours.

Example 3

The following is an example of the preparation of microcapsules by interfacial polymerization.

To 44 g of the oil phase, prepared as described above in Ex. 1, is added 1.0 g of sebacoyl chloride (Aldrich). Three milliliters of the mixture is then dispersed in 200 mL of water with stirring at 300 rpm at room temperature. To this dispersion is then added 2.5 mL of a 10 wt.% aqueous solution of 1,6-diaminohexane. Capsules form after about one hour.

Encapsulated electrophoretic displays and materials useful in constructing them are therefore described. Additional aspects and advantages of the invention are apparent upon consideration of the foregoing. Accordingly, the scope of the invention is limited only by the scope of the appended claims.

What is claimed is:

1. A multi-color, encapsulated electrophoretic display, comprising:

at least three species of particles, the particles having substantially non-overlapping electrophoretic mobilities,

wherein the multi-color display predominately displays one of the species of particles in response to a sequence of electrical pulses controlled in both time and amplitude.

2. The display of claim 1, wherein said display comprises a capsule in a binder encapsulating said at least three species of particles.

3. The display of claim 1, wherein said at least three species of particles comprises magenta, cyan, and yellow particles.

4. The display of claim 1, further comprising suspending fluid having a density substantially matched to the density of said at least three species of particles.

5. The display of claim 4, wherein said suspending fluid is a halogenated hydrocarbon.

6. The display of claim 5, wherein said suspending fluid is tetrachloroethylene.

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7. The display of claim 5, wherein said suspending fluid is poly(chlorotrifluoroethylene) polymer.

8. The display of claim 7, wherein said polymer has a degree of polymerization from about 2 to about 10.

9. The display of claim 4, wherein said suspending fluid comprises a mixture of two or more fluids.

10. The display of claim 4, further comprising an oil-soluble dye the said suspending fluid, said dye being selected from the group consisting of anthraquinone, azo, and triphenylmethane type dyes.

11. The display of claim 4, further comprising a surfactant in said suspending fluid.

12. The display of claim 11, wherein said surfactant is sodium dodecylsulfate.

13. The display of claim 2, wherein said binder is selected from the group consisting of water-soluble polymers, water-dispersed polymers, oil-soluble polymers, thermoset polymers, thermoplastic polymers, uv-cured polymers, radiation-cured polymers, gelatin arabic, gum arabic, polyurethanes, polyamides, urea formaldehyde resin, melamine formaldehyde resin, cellulose, cellulose derivatives, polyvinylacetates, and polyvinylalcohol.

14. The display of claim 13, wherein said binder further comprises an additive selected from the group consisting of organic surfactants, organic salts, organic particles, and organic pigments.

15. The display of claim 1, wherein said at least three species of particles are titania.

16. The display of claim 1, wherein said at least three species of particles are metal oxide-coated titania.

17. The display of claim 16, wherein said metal oxide is selected from the group consisting of aluminum oxide and silicon oxide.

18. The display of claim 17, wherein said metal oxide-coated titania comprises two layers of metal oxide coating.

19. The display of claim 18, wherein said titania is coated with both aluminum oxide and silicon oxide in either order.

20. The display of claim 1, further comprising a charge control agent.

21. The display of claim 20, wherein said charge control agent is polyisobutylenesuccinimide.

22. The display of claim 20, wherein said charge control agent is a metal soap.

23. The display of claim 20, wherein said charge control agent is lecithin.

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